



YEAR 2000 COMPLIANCE STUDY

Submitted by:
U.S. Army Engineering and Support Center
CEHNC-PM-MP (Tahir Rizvi)
Operation and Maintenance Engineering Enhancement (OMEE)
Corps of Engineers Technical Center of Expertise (TCX)

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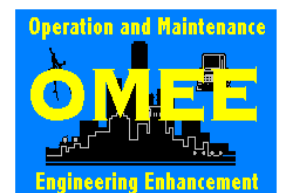
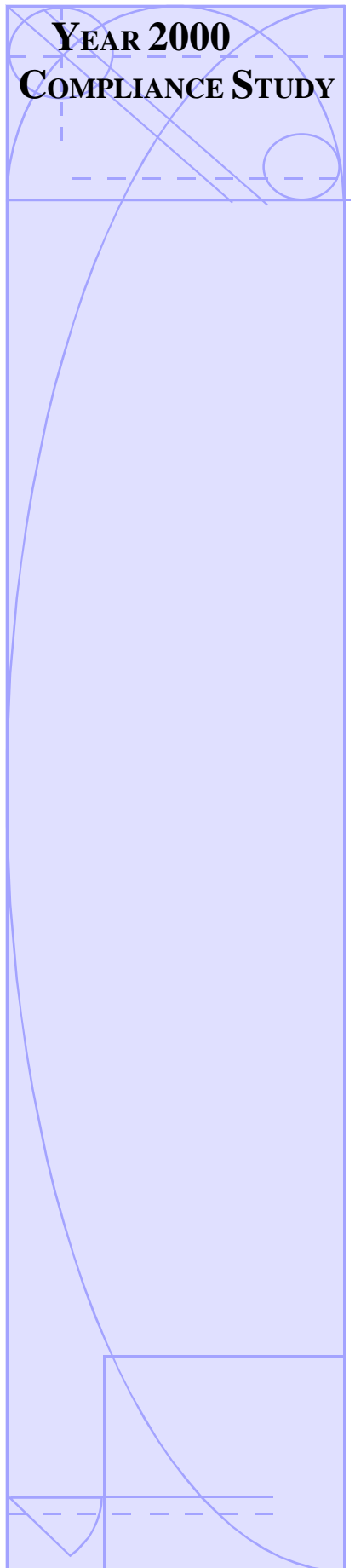


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INTRODUCTION

Organizations throughout the world have been focusing on problems resulting from the Year 2000. Most organizations will be affected by this problem in one way or another, and might even find themselves out of business if they do not address the issues. The "Year 2000" (Y2K) problem results from efforts to save electronic data space and to reduce hardware and software costs. By 1992, many manufacturers were aware of the problem and developed equipment and systems to allow an easy passage between the years 1999 and 2000. They were called Y2K compliant. The disruptions are expected to be found in systems relying on older computers, the use of older programs that have migrated to newer systems, and the interaction between the real time clocks in the hardware and in the system programs. This study deals with the Year 2000 (Y2K) impact to organizations from facility-related equipment and systems.

Any electronic device in a facility that calculates a date, uses a date, displays a date or prints a date can be considered a candidate for producing a Y2K problem. A few examples of devices that may be affected include: personal computers, microprocessor-based systems such as chiller controls, VCRs, electronic timers and date books.

Initially, the Y2K problem was expected to be only a two digit versus four digit recognition problem that would occur solely on January 1, 2000 (1/1/00), because some computer software does not recognize "00" as an abbreviation for the Year 2000. It has been determined, however, that there are a series of dates that may cause problems. These dates fall both before and after January 1, 2000 and have the potential to cause system failures if they are not addressed.

A plan has been developed and included in this study to help individuals involved in the operation and maintenance of facilities to address critical questions revolving around the Y2K issue.

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- ‡ What systems are affected?
- ‡ What are the potential impacts to the facility?
- ‡ How much will it cost to become Y2K compliant?
- ‡ How long will it take?
- ‡ When should we start?
- ‡ Where can we go for assistance?

POTENTIAL FACILITY SYSTEMS IMPACT

Since the 1970's, increased reliance has been placed on computers and microprocessors to control and monitor the operation of facility systems equipment. The Y2K problem affects facility systems because they implement commands based on date and time. The impact may be as trivial as inaccurate reports or as substantial as the complete failure of one or more critical systems. A concurrent failure of two or more systems is risky even in a commercial building. The failure of even one building system at a Hospital or Data Center could have dangerous effects.

Facility systems that may be affected by the Y2K issue include:

- ‡ Fire/Life Safety Controls
- ‡ Emergency Power Systems
- ‡ Uninterruptible Power Supply Systems
- ‡ Refrigeration (Chillers) and Heating (Boiler) Plants
- ‡ HVAC Systems and Controls
- ‡ Lighting Controls
- ‡ Communications Systems- Voice/Data (PBX/LAN/WAN)
- ‡ Elevators
- ‡ Security Systems and ADA Doors
- ‡ Electrical Demand and Load Shedding Systems

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POTENTIAL FACILITY SYSTEMS IMPACT

Building Management Systems

Building Management Systems (BMS) used for varying the amount of lighting, modulating the air flow, and for maintaining temperatures in the building, are typically date and time dependent. The number of elevators in service in high-rise buildings are often optimized by computer programs that rely on the date and time of day to determine the passenger handling capacity of the building. Elevator maintenance is keyed to scheduled dates. Some elevator systems will discharge their passengers at the lobby and automatically shut down if the scheduled maintenance is overdue. Electrical peak shaving and demand control systems rely on the date and time to determine which loads to shed.

Fire Protection Systems

Some sophisticated fire protection systems rely on scheduled maintenance dates. If the scheduled maintenance is overdue, the system may be programmed to shut down the air conditioning systems as if there was a fire. This could occur at any time of the day.

Facility Support Systems

Facility Support Systems such as Computerized Maintenance Management Systems (CMMS) may also be impacted by Y2K. CMMS's require comparisons with data obtained in prior years which is used for equipment records, trending, benchmarking and reporting. If the data was compiled using non-compliant software, 1998 and 1999 data would need to be recovered for Year 2000 reports.

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Fire Life Safety Systems are often controlled by hardware and software that could be affected by Y2K.

POTENTIAL FACILITY SYSTEMS IMPACTED

Medical Facility Systems

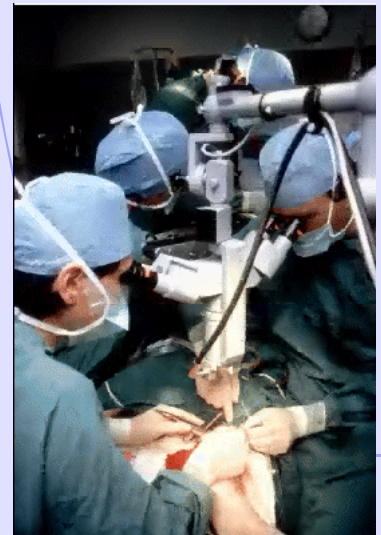
Medical equipment and the facility systems support equipment may also be effected by Y2K. Because of the danger to the health of patients should a medical facility system fail, hospitals are faced with the problem of secondary liability. This could occur if a patient is harmed due to the failure of the medical equipment or the facility equipment fails to operate properly. Hospitals need to consider the costs of not identifying and correcting Y2K issues. Injuries resulting from system failures because of the “Year 2000 Problem” are different from injuries caused from a building being damaged by “Acts of Nature” (e.g. earthquakes, floods, etc.). However, the Year 2000 problem at a hospital can be avoided.

Other hospital related issues include JCAHO accreditations. For example, incorrect dates on reports on Preventive Maintenance documentation could lead to “problems” with the JCAHO. Years worth of electronic maintenance history could be lost. These types of issues should be addressed in the Compliance Plan.

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What happens if the Air Handler serving this operating room fails in the middle of an operation because it wasn't Y2K compliant? The hospital could be liable for patient complications resulting from this type of incident. This is a correctable problem that needs to be addressed.



IDENTIFYING THE CAUSES

Non Compliant Hardware

In a personal computer (PC), a battery operates a real-time clock chip (RTC). The RTC chip maintains the current date and time, whether the PC is on or off. In most PC's the RTC chip calculates only the last two digits of the year, not all four digits. The century designation is stored on the chip as a 19 or a 20, and is usually not controlled by the RTC. When the date changes from December 31, 1999 to January 1, 2000, the 99 will change to 00, but the century digits will remain at 19. As a result, the RTC will report the date as January 1, 1900.

Non Compliant Software

After the computer is booted, most operating systems look to the Basic Input-Output System (BIOS) for the current date and time. The BIOS obtains its current time and date from the RTC chip. Typically, the operating system will then update its own clock, including a four-digit year, and not look to the BIOS again for the date and time. If that particular PC is not shut down over the change from 1999 to 2000, the operating system will provide the correct date and time in the year 2000. If the BIOS is not Y2K compliant, the century digits remain as 19. If the computer is shut down and then restarted, the operating system will again look to the BIOS for the date. The system will indicate an incorrect date such as the year 1900 or the year 1980. The year 1980 can appear because some operating systems do not recognize any dates earlier than 1980 as valid. The Y2K Problem that appeared to have been avoided will arrive on the start up after the first shut down in 2000.

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There are solutions to the Y2K problem. With experienced help, problems resulting from Y2K issues *can* be avoided.

INVESTIGATE/DEVELOP STRATEGY

Vendor Issues / Testing

Even if a manufacturer indicates that their hardware and/or software is Y2K compliant, it is still the responsibility of the end user to make certain the system is compliant. This is accomplished by testing the components, which are often supplied by different manufacturers, and then testing the system. Testing only the components is not the answer. Often the results of a component by component test meet all the specifications. Problems often occur when components are required to work in concert with other components. Similar results brought about the introduction of commissioning requirements for the building systems. For years, the individual components were field tested (fans, dampers, etc.) and then accepted. The performance of the components interacting within a system was not tested. Commissioning includes specific operating scenarios that must be met before the equipment that makes up the system can be accepted. The same type of testing should be performed to assure systems are Y2K compliant.

New Construction Contracts

The contents of new construction contracts do not automatically include Y2K compliance. New construction contracts must contain specifics for Y2K compliance. Year 2000 clauses should be written into A-E design contracts, construction contracts and vendor service contracts. In addition the construction contracts should include “testing” clauses for vendor equipment. In the right margin are some issues to keep in mind.

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- ‡ Testing one system to validate all systems of the same type can be risky.
- ‡ Check with the vendor before changing Real Time Clocks to the year 2000. Some century dates cannot be reset to 19 once they have been set to 20 without replacing hardware.
- ‡ Unless it is clearly included in the agreement, do not expect that a vendor's service agreement covers Y2K compliance or that the vendor has liability should a system fail.
- ‡ Y2K compliant equipment hardware and software can accurately process date and time data for the years 1999, 2000, and 2001 regardless of the number of shut downs and start ups of the equipment.
- ‡ All the new equipment must be factory tested and certified to be Y2K compliant.

VALIDATION

In order for Y2K compliance to be successful, a comprehensive test procedure must be developed. The testing should include the use of all dates that may cause a problem for the systems or components. The testing should be performed for each component as well as the entire system.

When developing a testing procedure, it is important to not only test suspected non-compliant systems, but also to include all other integrated systems. This includes integrated components and systems that the manufacturer/vendor has stated as being compliant

Cutoff Date for Completing Y2K Work

Initially, the Y2K problem was considered a problem of two digit versus four digit recognition and expected to occur only on January 1, 2000. This is because some computer software does not recognize "00" as an abbreviation for the year 2000. As a result, many organizations had initially planned on December 31, 1999 as the cut off date to complete Y2K work. It has since been discovered that to save memory or as a short cut, some programmers stored error codes in easy-to-remember locations such as 9/9/99. For systems with this programming, September 9, 1999 will be a problem. In order to insure compliance before a potential problem can occur, it is highly recommended that all Y2K solutions be implemented before September 9, 1999.

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Pitfalls After January 1, 2000

- ‡ The date might be correct, but the day of the week could be in error. This could affect the operation of elevators and heating, ventilating, and air conditioning systems (HVAC) if the true day was Friday but the software was indicating Saturday.
- ‡ The days and dates in the leap year of 2000 could occur smoothly and leap year 2004 could present a problem.
- ‡ The system could run smoothly until the change from standard time to daylight saving time.
- ‡ A delayed Y2K problem that can occur when a computer is shutdown and then restarted months and years after January 1, 2000.

APPROACH TO Y2K COMPLIANCE

SIX STEP PROCESS

There are key elements to be addressed in any approach to obtain Y2K compliance. These key elements include identifying potential impacts and assessing the associated risks. The following is the Six-Step Process approach.

STEP 1. SURVEY

Survey of all Facility Systems/ Equipment using computers or embedded microprocessors.

Effort to gather equipment lists

Review equipment inventory (if available)

Review preventive maintenance lists.

Review all the equipment log print-outs

Review vendor service contracts

Interview equipment vendor engineering personnel

Interviews with site personnel

Develop Y2K Survey Form

Perform On-Site Survey of Facility Systems for Y2K

Compliance and validate the completeness of the Y2K compliance list

STEP 2. IDENTIFICATION

Identification of Potential Building Systems/Equipment Compliance Issues

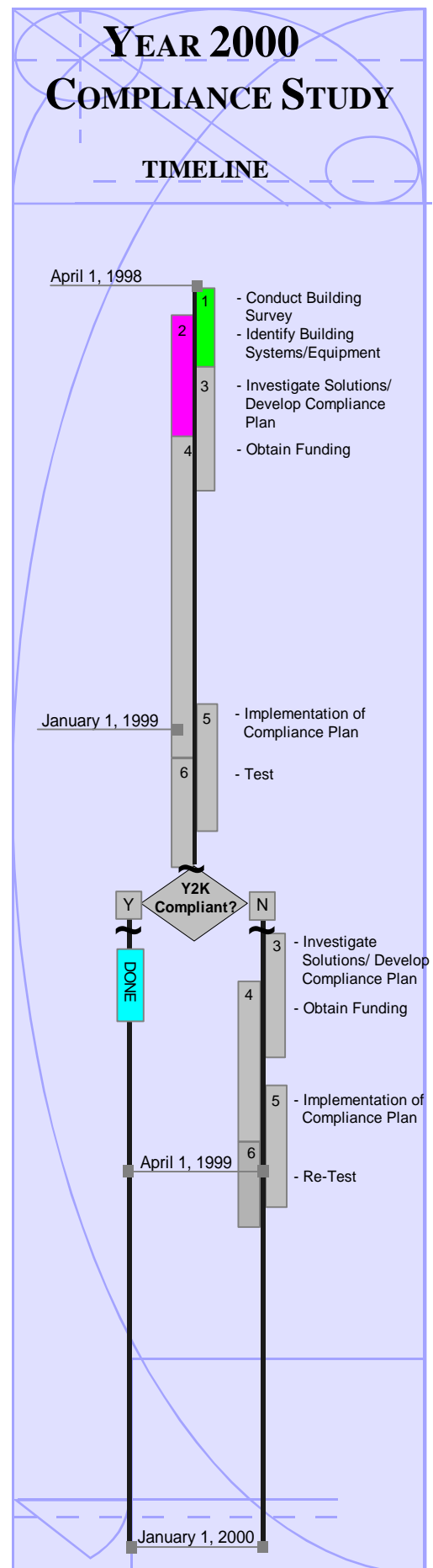
Contact Equipment Vendors and ask for Compliance Documentation and Testing Procedures

If equipment vendor indicates not compliant:

Go to **Step 3.**

If equipment vendor indicates compliant:

Go to **Step 6.**



APPROACH TO Y2K COMPLIANCE

STEP 3. INVESTIGATE/DEVELOP STRATEGY

Investigation of Facility Systems/Equipment Compliance Issues/Develop Strategy for Equipment Modification/Replacement

- Assess survey data and develop findings
- Review findings with site personnel
- Review findings with equipment vendor
- Identify risk/potential impact
- Prioritize results
- Develop strategy for equipment modification/replacement
- Develop cost estimate for equipment modification/replacement

STEP 4. FUNDING

Determine Funding Strategy, Obtain Funding

- Determine procurement strategy
- Obtain funding
- Develop compliance plan and project time line

STEP 5. IMPLEMENTATION

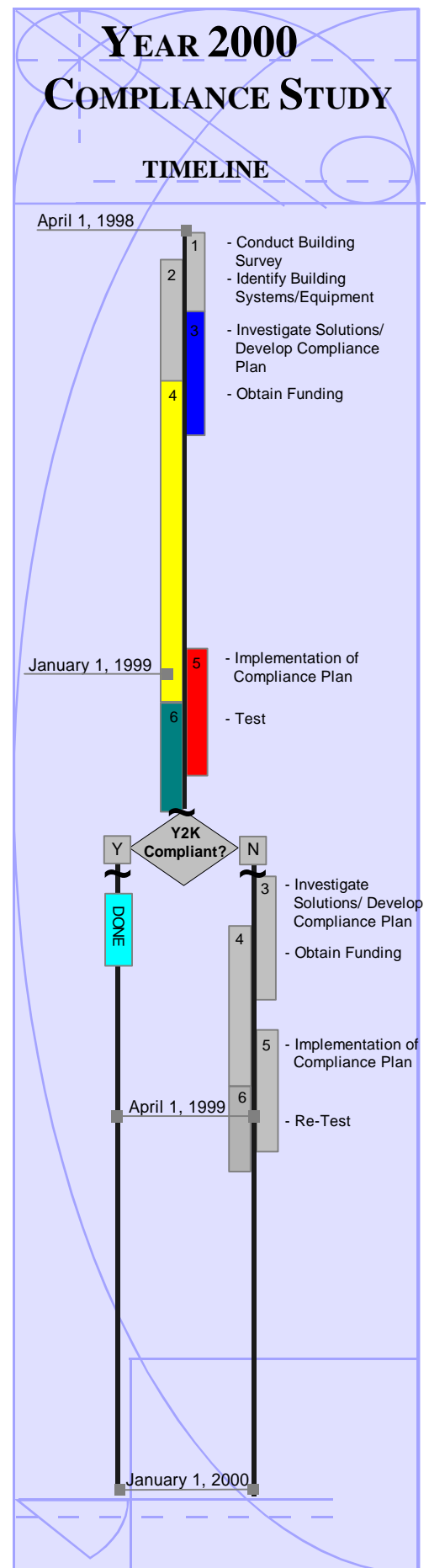
Implementation of Compliance Plan

- Procure system/equipment
- Install system/equipment

STEP 6. VALIDATION

Validation Testing of Building Systems/Equipment

- Develop test procedures for system/equipment
- Perform system equipment testing
- Coordinate testing schedule to allow for minimum facility interruption during testing
- If compliant, document findings/results.
- If non-compliant, return to **Step 3**.
- Repeat Steps **3-6** until system/equipment is compliant.



THE CRUNCH

In developing and implementing a Y2K compliance plan, three items that can affect your scheduling, purchasing and mobilization of personnel are:

- ‡ The rush to bring systems into compliance has begun.
- ‡ Manufacturers are experiencing backlogs.
- ‡ Experts to sort out the problems and are in short supply.

These three items emphasize the need to start a Y2K compliance program as early as possible.

SUMMARY

This study outlines the major issues related to Y2K for Facility Systems. An approach to Year 2000 compliance has been presented. The keys to compliance are a timely program start and adequate funding. With a thorough Compliance Plan the impact of Y2K can be minimized or eliminated. For those Facility Management Groups that are not proactive and who do not seriously attack all the Y2K issues, the impact could be disastrous.

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CASE STUDY

MIKE O'CALLAGHAN FEDERAL HOSPITAL,
NELLIS AIR FORCE BASE, LAS VEGAS, NV

YEAR 2000 COMPLIANCE STUDY

INTRODUCTION

A year 2000 Compliance Program is presently being undertaken at the Mike O'Callaghan Federal Hospital in Las Vegas, Nevada. The facility is a joint venture between the United States Air Force and the Department of Veterans Affairs. It is located on a 49 acre site just north of Las Vegas at Nellis Air Force Base. The facility has 115 beds, 38 dental treatment rooms and 11 clinics, supporting an active duty, retired and veteran population. The 374,000 square foot, four-story hospital and associated clinic were completed in mid-1994 and feature an external central energy plant to provide steam and chilled water to the Hospital.



It should be noted that the age of this facility is relatively “new.” A four year old hospital has less Y2K issues than most older facilities. Any interpolation of these results for other buildings should take into account the facility age and types of systems installed.

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The following is an overview of the Year 2000 Compliance Program status at the Mike O'Callaghan Federal Hospital.

SYSTEMS SUMMARY

A detailed analysis of each of the systems surveyed for the Mike O'Callaghan Federal Hospital appears below.

- | | | |
|---|---|-----------|
| • Number of Systems Surveyed | = | 27 |
| • Number of Systems Testing/Investigation | = | 16 |
| • Systems Tested | = | 14 |
| • Number of Non-Compliant Systems | = | 2 |

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SYSTEM INFORMATION

1. PEGASUS SOFTWARE - HVAC CONTROLLER

Description

The HVAC control systems consists of field panels that have control points to control fans, pumps, valves, dampers, and other control points, as well as an integrated Time Of Day control that is time and date reliant. Control software is built into each panel that runs, controls and monitors each item and takes action, records or adjusts depending on its mode of operation. Some of the control code is dependent on the time of day or a date. All of the field panels are connected together in a network to talk to each other and share information.

The network is tied into the Host computer that is programmed to take the information from the network and provide a user a graphical interface with the control panels.

Building Integration

Controls/monitors critical building systems such as the air handling units and the Central Energy Plant systems.

Year Date Mode

2-digit.

Date Use

The date, from three clocks based on an RTC, is used to initiate events. Any change in equipment status will be recorded using the clock time.

Testing Approach

No testing is currently being performed as the vendor has warned that any attempt to test dates will result in the system locking up.

Test Results

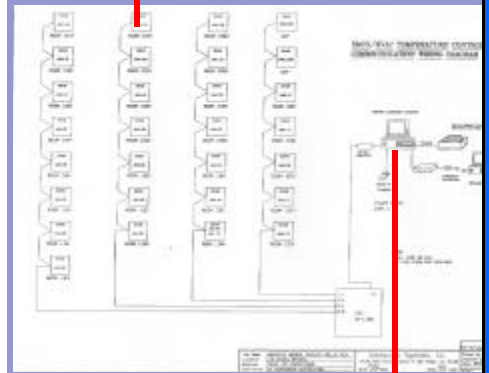
No test will be performed until the system is upgraded to be Y2K compliant.

Discussion of Non-Compliance

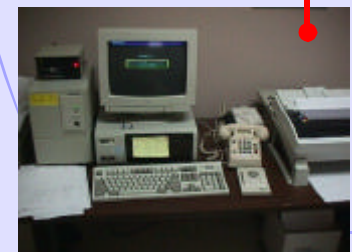
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Centaurus Simux Controls



Simux Schematic



Centaurus HVAC
User Interface

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The hardware and software must be upgraded by the system provider. The Disk Operating System (DOS) for the Pegasus Software is non-compliant and must be replaced. There will be labor costs involved, and a considerable amount of lead time to procure the materials.

Y2K Compliant?

No.

Y2K Impact

The present system will not function in the year 2000 and will not operate.

Recommendations

Update to new Windows NT System

Y2K Installation/Testing Discussion:

Two software upgrades and additional hardware, software and firmware will make the system fully Y2K compatible. The impact to the facility is a major one in that the entire system must be upgraded. This could necessitate a considerable amount of time, and have a major impact to the occupants.

2. TOUCH COMMAND IRRIGATION CONTROLLER

Description

This controller schedules watering over 24 lawn zones surrounding the main building.

Building Integration

None.

Year Date Mode

7 Day, 24 hour, no year

Date Use

Date function is used for generating reports.

Testing Approach

Not applicable.

Discussion of Non-Compliance

The irrigation controller regulates irrigation valves based upon a 24-hour clock. The software does not use a Date function based upon a Real Time Clock (RTC). The various field panels

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that monitor and report do not use the date function.

Y2K Compliant?

Yes.

Recommendations

No further action is required.

3. YORK CHILLER CONTROL PANEL

Description

The three York Chiller controllers monitor and control the centrifugal chillers that produce chilled water for the entire hospital.

Building Integration

The chillers provide chilled water to all of the building air handling units.

Year Mode

2-digit.

Date Use

Date function is used for trapping and displaying errors, faults and failures during chiller operation.

Testing Approach

Three significant compliance dates were used: 9/9/99, 1/1/00, 2/29/00.

Test Results

No adverse effects were observed.

Y2K Compliant?

Yes. A letter from the manufacturer confirms that the system is Y2K compliant.

Recommendations

No further action is required.

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York, Chiller controller



York, 250 Ton
Centrifugal Chiller

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4. ELEVATOR LOGIC CONTROLLERS

Description

Controller processes user requests for moving car to different floors. Also provides alarm and door functions.

Building Integration

Interconnected to Fire Life Safety System.

Year Mode

N/A

Date Use

N/A

Testing Approach

N/A

Y2K Compliant?

Yes. A letter from the vendor confirms that this type of elevator does not use the date function.

Recommendations

No further action is required.

5. FUEL OIL STORAGE TANK LEAK DETECTOR

Description

This panel monitors and reports leaks from underground storage tanks for #2 diesel. The #2 oil supplies the emergency generators and serves as a backup fuel source for the boilers.

Building Integration

None.

Year Mode

2-digit.

Date Use

Reports and Alarms

Testing Approach

Three significant compliance dates were used: 9/9/99, 1/1/00, 2/29/00.

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Dover Elevators



EECO Leak Detection

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Test Results

No adverse effects were observed.

Y2K Compliant?

Yes. A letter from the vendor indicates that the system will display "00" in the year 2000.

Recommendations

No further action is required.

6. LIEBERT HVAC CONTROLLER

Description

These controllers provide single zone control for computer data center air conditioning unit. The scheduling function has been disabled as the unit runs 24 hours, 7 days per week.

Building Integration

The computer system served by this system connects all building personnel via. the local area network.

Year Date Mode

N/A

Date Use

N/A

Testing Approach

N/A

Y2K Compliant?

N/A

Y2K Impact

None.

Recommendations

Since the date function has been disabled, no further action is required.

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7. TELEVISION/CABLE DISTRIBUTION SYSTEM

Description

This system carries VCR programming throughout the Hospital.

Year Date Mode

N/A

Date Use

The TV Cable distribution system does use the date function for its programming.

Testing Approach

N/A

Y2K Compliant?

Yes

Recommendations

No further action is required.

8. SATELLITE DISH CONTROLLER

Description

This controller controls the direction of the satellite receiver dish on pre-established coordinates.

Building Integration

None.

Year Mode

N/A

Date Use

N/A

Testing Approach

N/A

Y2K Compliant?

Yes

Recommendations

No further action required



Satellite Dish Controller

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9. CHARACTER GENERATOR FOR TELEVISION DISTRIBUTION SYSTEM

Description

The character generator supplies video characters to the entire television network

Building Integration

Television system.

Year Date Mode

4-digit.

Date Use

All system functions.

Testing Approach

System subjected to a variety of key compliance dates.

Test Results

No adverse conditions were observed.

Recommendations

No further action is required.

10. FIRE ALARM SYSTEM

Description

The Fire Alarm System Technology (F.A.S.T.) system is an integrated Fire Alarm detection and reporting system

Year Mode

4-digit.

Date Use

Date code is used to identify trouble and fault codes. Dates are displayed and printed on reports.

Testing Approach

A variety of dates ranging into the 21st century were used to assess the system.

Test Results

No adverse conditions were observed.

Y2K Compliant?

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Character Generator



F.A.S.T. Field Panel

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Yes.

Recommendations

No further action is required.

11. NURSE CALL SYSTEM

Description

The nurse call system is a reporting and intercom system for each inpatient hospital room.

Building Integration

None.

Year Mode

N/A

Date Use

N/A

Testing Approach

N/A

Y2K Compliant?

Yes.

Recommendations

No further action is required.

12. ADT SECURITY SYSTEM DISPLAY AND REPORTING COMPUTER

Description

The system reports and alarms exterior Hospital doors. Information is displayed on a Liquid Crystal Display (LCD) system.

Building Integration

All Secure Doors on the exterior of the building.

Year Mode

2-digit.

Date Use

Reports and Alarms.

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Testing Approach

The system was subjected to a variety of key compliance dates.

Test Results

No adverse conditions were observed.

Y2K Compliant?

Yes.

Recommendations

No further action is required.

13. SIMPLEX CARD READER ENTRANCE CONTROL

Description

This magnetic card reader controls the entrance doors to the Medical Warehouse and secure storage areas.

Building Integration

This is a stand-alone system.

Year Mode

N/A

Date Use

N/A

Testing Approach

N/A

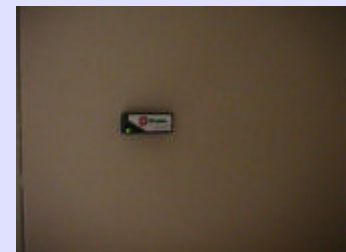
Y2K Compliant?

Yes. The units do not use a date for their programming.

Recommendations

No further action is required.

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Simplex Card Reader



Simplex data printer

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14. SECURITY VIDEO SURVEILLANCE SYSTEM

Description

The system consists of 4 cameras that survey the parking lots and all 4 channels are recorded 24 hours per day on a recorder.

Building Integration

Security System

Year Mode

4-digit.

Date Use

The recorder provides a date/time stamp for logging information.

Testing Approach

The system was tested using a variety of key compliance dates.

Test Results

No adverse conditions were observed.

Y2K Compliant?

Yes.

Recommendations

No further action is required.



Ultrak Security
Camera System

15. HVAC ZONE CONTROLLERS

Description

The controller maintains room/space temperature.

Building Integration

HVAC System

Year Mode

N/A

Date Use

N/A

Testing Approach

N/A

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Y2K Compliant?

Yes.

16. VARIABLE SPEED CONTROLLERS

Description

Safronics Variable speed controllers are used to adjust the output of pumps and fan motors throughout the building.

Year Mode

N/A

Date Use

N/A

Testing Approach

N/A

Y2K Compliant?

Yes. The units do not use a date for their programming.

Recommendations

No further action is required.

17. VARIABLE SPEED DRIVE - FACE VELOCITY CONTROLLER

Description

This component is a part of the HVAC system; its function is to measure the air volume of a variable supply fan of a variable air volume (VAV) system.

Building Integration

This controller sends information to the Centaurus Simux panel to vary the speed of the supply fan, variable speed drive controller.

Year Mode

N/A

Date Use

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Safronics, Variable Speed
Controller

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N/A

Testing Approach

N/A.

Y2K Impact

None.

Recommendations

No further action is required.

18. PROGRAMMABLE LOGIC CONTROLLER, IDEC

Description

This stand alone component sequences damper operations for several air handler operating modes.

Building Integration

HVAC System

Year Mode

N/A

Date Use

N/A

Testing Approach

N/A

Y2K Compliant?

Yes. The IDEC does not use a Date module in this configuration.

Recommendations

No further action is required.

19. PROGRAMMABLE LOGIC CONTROLLER - DOMESTIC WATER SYSTEM

Description

This controller, located inside an electrical panel in the lower level mechanical room, controls the booster pumps to the domestic water system.

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Klockner Moeller PLC

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Building Integration

Mechanical Hydronic System

Year Mode

N/A

Date Use

N/A

Testing Approach

N/A

Y2K Compliant?

Yes. The PLC does not use a Date module in this configuration.

Recommendations

No further action is required.

20. LAPTOP COMPUTER (INTERFACE WITH CENTAURUS SYSTEM) - REMOTE HVAC CONTROLLER ACCESS

Description

The computer is used to interface directly into the Centaurus Simux Panels. Computer provides the ability to verify, list and modify the panel's functions.

Building Integration

All HVAC equipment including air handlers and Central Energy Plant Systems.

Year Mode

2-digit.

Date Use

All computer functions.

Testing Approach

None. Operating system known **not** to be Y2K compliant.

Test Results

YEAR 2000 COMPLIANCE STUDY



Centaurus Laptop Computer

CASE STUDY

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Not applicable.

Discussion of Non-Compliance

The DOS (Disk Operating System) software operating system will need to be upgraded by the vendor.

Y2K Compliant?

No.

Y2K Impact

The computer is used as an emergency connection with the 23 field Simux panels in the event that the Host computer is unable to communicate with them. Without the upgrade, the computer will not function.

Recommendations

Upgrade operating system and user software

21. FIREYE BOILER FLAME CONTROLLER

Description

The Fireye fire control system for the Cleaver Brooks boilers (3 each) does not have a date function. This system monitors and prints out any deficiencies of a defined range for steam temperature, pressure, boiler stack conditions, etc.

Building Integration

Steam from the boilers is used for a variety of Hospital functions, including comfort heating, hot water generation and steam sterilization.

Year Mode

N/A

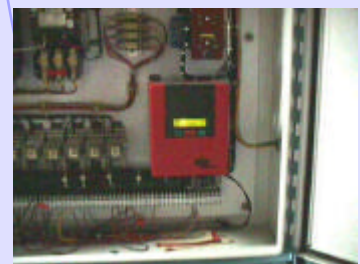
Date Use

N/A

Testing Approach

N/A

YEAR 2000 COMPLIANCE STUDY



Fireye Flame Controller

CASE STUDY

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NELLIS AIR FORCE BASE, LAS VEGAS, NV

Y2K Compliant?

Yes.

Recommendations

No further action is required.

22. CHILLER REFRIGERANT LEAK DETECTION EQUIPMENT

Description

The Yokogawa Halogen leak detector system in a monitoring system to detect, alarm, report and control upon the detection of a halogen leak in the 3 chillers in the Central Energy Plant.

Building Integration

The system is tied into the F.A.S.T. Fire Alarm System Technology system and uses the network to display and report an alarm condition to the Security personnel and the Fire Department on Nellis Air Force Base.

Year Mode

4-digit.

Date Use

The date function is used for trapping error codes and when generating reports.

Testing Approach

The system was subjected to a variety of key compliance dates.

Test Results

No adverse conditions were observed.

Discussion of Non-Compliance

This system has been tested and a certification from the manufacturer verifying its Y2K compliance has been submitted.

Y2K Compliant?

Yes

Recommendations

No further action is required.

YEAR 2000 COMPLIANCE STUDY



Yokogawa Halogen
Leak Detector

CASE STUDY

MIKE O'CALLAGHAN FEDERAL HOSPITAL,
NELLIS AIR FORCE BASE, LAS VEGAS, NV

YEAR 2000 COMPLIANCE STUDY

23. STEAM MONITOR - CENTRAL ENERGY PLANT

Description

This integrated system monitors the steam systems in the Central Energy Plant and displays and prints a report upon a change of status.

Building Integration

This is a stand-alone system.

Year Mode

2-digit.

Date Use

The system uses the date for trapping error codes, displaying and printing information.

Testing Approach

The system was subjected to a variety of key compliance dates.

Test Results

No adverse conditions were observed.

Discussion of Non-Compliance

The vendor could not be located and is apparently out of business.

Y2K Compliant?

Yes.

Y2K Impact

The year 2000 will be displayed and reported as "00" on the printer.

Recommendations

No further action required



Mastermind Steam Monitor

24. EMERGENCY CALL DATA LOGGER

Description

A component of the security system an integrated with the AT&T Telephone system, the data logger records all telephone calls made from the Hospital Emergency Room.



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Building Integration

This system works in conjunction with the telephone system.

Year Mode

2-digit.

Date Use

The date function is used to trap errors and for report generation.

Testing Approach

The system was tested using a variety of key compliance dates.

Test Results

No adverse conditions were observed.

Y2K Compliant?

Yes.

Recommendations

No further action is required.

25. TIME CLOCK - LOGISTICS CUSTOMER SERVICE DESK

Description

It is used to log in-out orders for the customer service counter for hospital/medical products.

Building Integration

This is a stand-alone system.

Year Mode

N/A

Date Use

N/A

Testing Approach

N/A

Y2K Compliant?

Yes

Y2K Impact

YEAR 2000 COMPLIANCE STUDY



Acroprint
printing time clock

CASE STUDY

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None.

Recommendations

None.

26. VIDEO CASSETTE RECORDER

Description

These components allow tapes to be played on different channels of the hospital television network.

Building Integration

NON-FACILITY O&M SYSTEMS

This a stand-alone system.

Year Date Mode

4-digit.

Date Use

Testing Approach

The system was tested with a variety of key compliance dates.

Test Results

No adverse conditions were observed.

Y2K Compliant?

Yes

Recommendations

No further action is required.

27. BANYAN VINES NETWORK - LOCAL AREA NETWORK (LAN)

Description

This Local Area Network (LAN) software allows users throughout the building to access and route information to and from servers for various applications. The Defense Medical Logistics Standard Support (DMLSS) system, used to manage the operation and maintenance of the building and other Logistics

YEAR 2000 COMPLIANCE STUDY



JVC Video Cassette Recorders

CASE STUDY

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functions, utilizes this network.

Building Integration

All users at the Hospital and at the Nellis Air Force Base.

Year Mode

Yes.

Date Use

All hardware and software functions.

Testing Approach

System was NOT tested.

Discussion of Non-Compliance

System has not yet been tested. However, the manufacturer has verified that the software controlling the network is NOT Y2K compatible.

Y2K Compliant?

No.

Y2K Impact

Local Area Network will not function. The DMLSS Program will not function over the network. Other critical hospital systems will cease to function.

Recommendations

Upgrade to NT 4.0.

Y2K Installation/Testing Discussion:

A complete hardware and software upgrade should be performed. The Hospital has indicated that this process will begin as early as July, 1998.

YEAR 2000 COMPLIANCE STUDY

CASE STUDY

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YEAR 2000 COMPLIANCE STUDY

IMPACT SUMMARY

Of the systems and components surveyed at the Hospital, the system that will have the most impact on facility operations is the Centaurus Heating, Ventilation and Air Conditioning (HVAC) control system. It has been determined by investigation that this system will cease to function on January 1, 2000. The Centaurus system controls all of the HVAC systems as well as the CEP (Central Energy Plant). The facility would not be able to support any occupants if this system was to stop functioning. In addition there are several other critical systems which should be tested to insure Y2K compliance. A fully integrated system test should be performed on those critical systems.

COST SUMMARY

There are several issues that need to be considered when estimating the cost of making these systems Y2K compliant and testing the systems to ensure compliance. There are obvious costs associated with the actual labor and materials to implement Y2K solutions. However, additional costs can be incurred in a facility that operates 24 hours a day, 7 days a week and where no downtime to critical systems like the HVAC Control System can occur.

Additionally, the survey work, preparation and presentation of results, and overall planning and management of the effort require a substantial amount of time to accomplish to minimize customer impact. The cost of training the building operators in the use of new software and any new equipment that was upgraded should also be factored in. Finally, because of the nature and complexity of the systems involved, some unforeseen difficulties can occur and additional funding for contingencies should be set aside as well.

For this case study, some initial costs have already been deter-

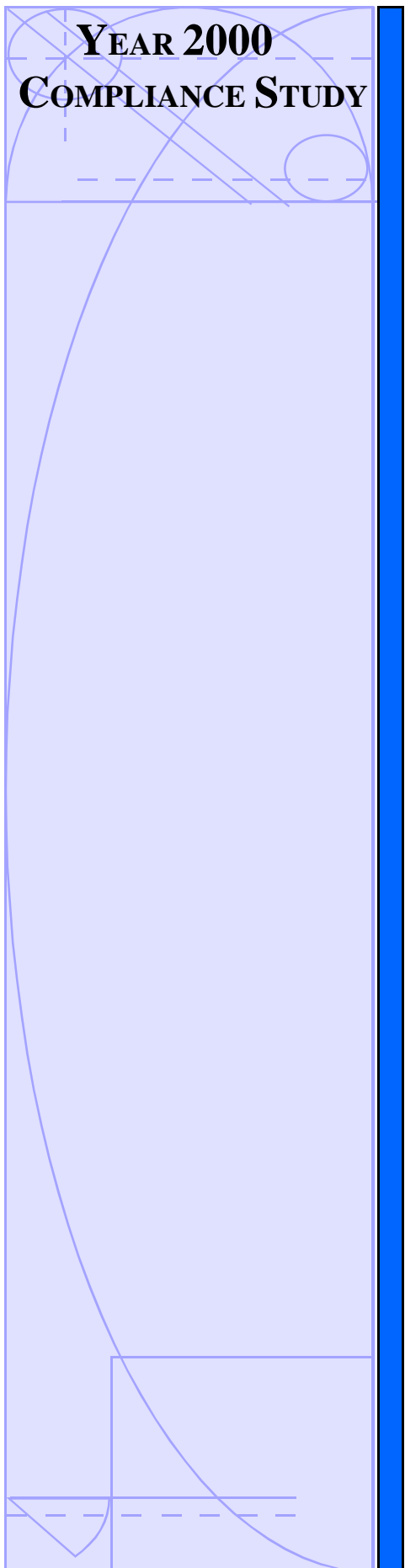
CASE STUDY

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mined; the remaining costs have been estimated based on the study results. On the following page is an estimate of overall cost of making the building systems at the Mike O'Callaghan Federal Hospital Y2K compliant. It should be noted that this is because of the newness of the Hospital (opened in 1994); the number of Y2K issues is relatively low. For older facilities there may be a significantly higher number of system issues.

As stated previously, interpolation of this data for use in any other building should be preceded with a review of the age and type of building systems. Also, for older facilities the cost of making an individual system compliant may be higher because of issues such as system obsolescence, lack of parts availability and vendors no longer being in business.

It is important that each facility develop their own Year 2000 compliance plan based on their facility systems. Comparison of the facilities could lead to incorrect results.



CASE STUDY

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<u>TASKS</u>	<u>COSTS (\$)</u>
Step 1: Perform building survey	10,792
Step 2: Identify potential non-Y2K equipment	10,240
Step 3: Investigate/develop compliance strategy	7,560
Step 4: Develop funding and compliance plan	7,680
Step 5: Procure equipment and install equipment	41,335
Step 6: Test system	20,838
Management of compliance effort	7,680
TOTAL FACILITY SYSTEMS COST	98,445
Banyan Vines System upgrade, based on estimates provided by hospital staff.	100,000
Total Cost	\$198,445

